

PHASE III

ENVIRONMENTAL SITE ASSESSMENT
conducted at

New England Telephone
Main Street,
Burlington, Vermont

for

New England Telephone

Prepared by

CON-TEST, INC.

18 Blair Park Road
Williston, Vermont
(802) 879-3008

Project #93-250-166

March 23, 1994

I. INTRODUCTION

A. Summary of Phase I Findings

On September 7, 1993 Wehran Envirotech conducted a subsurface assessment during removal of one 10,000-gallon kerosene underground storage tank (UST) at New England Telephone facility located on Main Street in Burlington, Vermont. The UST was removed by La Mountain Brothers, Inc. of Oxford, Massachusetts.

During excavation of the tank, Wehran personnel screened soils and performed headspace analysis (HSA) using a photoionization detector (PID) instrument. Readings ranged from 0 to 272 ppm (referenced from the UST reporting form). During excavation, approximately 10 cubic yards of soil was segregated and placed on polyethylene sheeting.

B. Purpose of Phase III Site Assessment

The purpose of the Phase III environmental site assessment is to quantify the extent of previously confirmed contamination in conjunction with the State of Vermont's Department of Environmental Conservation response letter dated September 22, 1993 for the above referenced site.

II. FIELD PROCEDURES

A. Monitoring Well Installation/ Soil Borings

A total of six soil borings were drilled utilizing a hollow stem auger. Three of the borings were converted to groundwater monitoring wells (locations are plotted on Figure 2). The work was performed on December 9, and December 10, 1993 by Tri-State Drilling and Boring, Inc. of West Burke, Vermont, under the supervision of Con-Test, Inc. personnel. A Mobile B-57 rotary drill was used to drill the wells. During drilling operations, soil samples were collected by split spoon method for on site soil analysis. One 10 foot section of PVC slotted (10 slot) screening was placed on the bottom of each well, followed by two-inch schedule 40 PVC casing as required.

Well casing joints were physically connected so that no binding agents or cements were used. Approximately one foot of powdered bentonite was poured around the casing to provide a seal at least 1.5 feet above the screen. Steel curb boxes or risers were placed over the casing and cemented into place. The wells were drilled to a maximum of 14 feet below ground surface. Monitoring well #3 was unable to be placed between the NET building and the YWCA building as proposed, because of water saturated soil conditions, overhead power cables, and inadequate access due to parked cars.

B. Soil Sampling and Field Analysis / Screening

Soil samples were collected at the 0'-2', 5'-7', and 10'-12' soil strata intervals with only a few variations. Soil samples were placed in ziplock bags and allowed to sit for approximately 10 minutes inside a heated location. Headspace analysis (HSA) of soil samples were obtained by slipping the probe of the instrument through a small opening in the bag and then quickly resealing the bag.

A portable Photo Ionization Detector - Model H-NU, calibrated to 47.3 ppm of Isobutylene was utilized to investigate soils during drilling operations. Core soil samples from the hollow stem auger were screened for VOC (Volatile Organic Compounds). Although no staining of soils or free product was observed, The H-NU Photo Ionization Detector readings indicated the presence of volatile organic compounds in the soils (see appendix A).

Soil contamination is occurring from the surface to the 15'-17' interval. The highest reading (160 ppm) occurred at a depth of 10'-12' (SB-01). The water table may fluctuate seasonally and is at an approximate depth of 4-5 feet at the time of the investigation. This indicates that contamination is below the water table.

III. GROUNDWATER SAMPLING

A. Analysis of Groundwater Samples

Groundwater samples collected from each of the three monitoring wells were tested for Volatile Organic Compounds (VOC's) utilizing EPA Method 8020 and Total Petroleum Hydrocarbons (TPH) using EPA Method 418.1.

Sample analysis for Total Petroleum Hydrocarbons (TPH) using EPA Method 418.1 showed no detection for all three wells. Sample analysis for Volatile Organic Compounds using EPA Method 8020 showed No Detection for Monitoring Wells #2 and #3. Monitoring Well #1 showed 1.0 ppm of toluene present in the groundwater (see sample results). This well is hydraulically down gradient of the tank grave and monitoring wells MW #2, and MW #3. This indicates that the contamination found is resulting from the release of tank product and not contamination from an upgradient source. Toluene is commonly found in fuels and solvents. The toluene found in this case is suspected to be from the fuel oil. The level of toluene detected is at the State of Vermont Maximum Contaminant Level of 1.0 ppm.

IV. INDOOR AIR SAMPLING

A. Collection and Analysis

A model 580-B Organic Vapor Monitor, calibrated to 47.3 ppm of Isobutylene, was used for the collection and analysis of air samples throughout the basement level of the New England Telephone building, to determine the presence of petroleum vapors.

Results of air sample analysis indicated no detectable levels of petroleum vapors were present. Con-Test was unable to conduct air sampling inside the adjacent YWCA building because access was denied at the time of the investigation.

V. GROUNDWATER HYDROLOGY

A. General

The site area is located up gradient and to the east of Lake Champlain. The natural surface topography slopes in the direction of the lake at an approximate grade of 6 to 8 percent. The natural groundwater flow direction is westerly towards the lake.

Groundwater hydrology at the tank location is influenced by site specific features that include the NET Building and a retaining wall immediately down gradient of the tank location. Refer to Site Sketch, SKETCH A, and Site Cross Section Sketch, SKETCH B. Measurements for these sketches were obtained by field taping and observation by the field technicians. Three monitoring wells were installed at the site. Monitoring Wells MW 2 & 3 are located at the same approximate surface elevation and approximately 15 to 17 ft above MW-1.

These wells have not been surveyed. Because of the significant site topographic features, an assessment of the groundwater flow characteristics has been not been performed by field survey. Flow characteristics are based on field measurements and observations alone.

The groundwater table at MW 2 & 3 is approximately 4.6 ft below surficial grade and at the same hydraulic grade. The elevation of the water table at MW 1 is approximately 6.2 feet below the surficial grade and the water table at this point is approximately 17 feet below the water table at MW 2 & 3.

B. Site Specific Features

The NET Building wall and foundation are immediately downgradient of the tank in the direction of groundwater flow. Officials at NET indicated that there has not been a water problem against the interior wall of the basement of the building at this location indicating the water table is probably below the basement floor elevation.

The retaining wall is approximately 9 to 10 feet in height and supports a grassed area above the parking area. The retaining wall had no observable weep holes.

Both the building and the retaining wall are assumed to redirect the groundwater flow, (to an undetermined extent), through a designed subsurface/foundation drain system or simply by groundwater flowing in the pervious backfill used around these structures.

Groundwater flow directional components at this time are assumed to be north and south around the structures and westerly, under the structures, in the direction of the natural groundwater flow. These flow components are indicated by arrows on the Sketch A. MW-1 is downgradient of the presumed westerly component of the groundwater flow. This well is assumed to be representative, to an undetermined extent, of groundwater degradation that may have occurred as a result of the leaking UST.

MW-2 & 3 are upgradient of the assumed groundwater flow components. These wells serve as background wells.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

Analysis of soil samples collected during drilling operations indicated the presence of volatile organic compounds. The peak reading was 160 ppm, found at soil boring #1 (see appendix A). This boring was located within ten feet to the south of the former underground storage tank.

Groundwater samples tested for Total Petroleum Hydrocarbons showed no detectable level for any of the monitoring wells. Groundwater samples tested for Volatile Organic Compounds showed no detectable level, except for Monitoring Well #1, where 1 ppm of toluene was detected. The level detected is at the State of Vermont Maximum Contaminant Level of 1.0 ppm of toluene. It is unlikely that the 1.0 ppm of toluene found in Monitoring Well #1 is a result of the installation of the new 8,000 gallon UST. If a spill had occurred, all BTEX compounds would be expected to be present at higher levels.

Monitoring well placement based on site specific conditions could have been different. Site conditions that included water saturated earth, power lines and trees prevented the drilling contractor from locating the well in the planned location.

B. Recommendations

CON-TEST is of the opinion that if groundwater contamination was elevated at significant levels, BTEX and TPH levels would be occurring at levels higher than what has been found to date at MW-1, (MW-1 Toluene @ 1.0 ug/l, ND-BEX and TPH), and Toluene would not be occurring alone. This opinion is made although we recognize that the groundwater flow patterns have not been fully defined at this location.

APPENDIX A

Appendix A
Project #93-250-166
NET Burlington

Soil Vapor Results

<u>Location</u>	<u>Depth (feet)</u>	<u>H-NU Reading (ppm)</u>
MW-1	0-2	0.0
MW-1	5-7	0.0
MW-1	10-12	0.0
MW-2	0-2	0.0
MW-2	5-7	0.0
MW-2	8-10	0.0
MW-3	0-2	0.0
MW-3	5-7	0.0
MW-3	10-12	0.0
SB1-1	0-2	40.0
SB1-2	5-7	52.0
SB1-3	10-12	160.0
SB2-1	0-2	30.0
SB2-2	5-7	60.0
SB2-3	10-12	50.0
SB2-4	15-17	3.0
SB3-1	0-2	51.0
SB3-2	5-7	110.0
SB3-3	10-12	60.0
SB3-4	13	25.0

SOIL PROBE LOG

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MW # 1

New England Telephone
Burlington, VTTRI STATE
DRILLING & BORING, INC.RFD #2, Box 113 West Burke, VT 05871
(802) 457-3123

		SAMPLER
		Continuous
TYPE	HSA	SS
SIZE	2"	
HAMMER	140#	
FALL	30"	

SOIL
Saturated
Wet
Moist
Damp
Slightly Damp

DATE STARTED: 12/09/93

DATE COMPLETED: 12/09/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

4-6'	9	100/41	10"	Moist.	
9-11'	12	9/16	21	17"	Wet.
14-16'	30	28	12"	Sat'd.	

Brown silty fine sands and small gravel,
some clay.

Red/brown fine sands, some gravel.

Gray fine sands, gravel (small)
throughout, some silt.

Set well 14'.

2 hours - well development.

Screen 14' to 4' below SS.
Riser to surface.
Sandpack 14' to 3' below SS.
Hole plug 3' to 1' below SS.
Install road box.Client: New England Telephone
Job Location: Burlington, VT
Engineer: Con-Test
Williston, VT
Inspector: RobDriller: Edward Westover
Helper: Hank Dawson
Materials: 10' screen, 4' riser,
1 cap, 1 locking plug, 3.5 sand,
2/3 hole plug, 1 road box.

SOIL PROBE LOG

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MW # 2

New England Telephone
Burlington, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-8123

TYPE	HSA	SAMPLER	Continuous	SOIL
SIZE	2"		SS	Saturated
HAMMER	140#			Wet
FALL	30"			Moist
				Damp
				Slightly Damp

DATE STARTED: 12/09/93

DATE COMPLETED: 12/09/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 16 24

4-6' 4 5 5 7 10" Sat'd.

Tan/brown medium/fine sands.

9-11' 43 38 1 8" Sat'd.

Gray silt fine sands and small angular stones compacted (till).

Auger refusal 12', set well.

2 hours - well development.

Screen 12' to 2' below GS.

Riser to surface.

Sandpack 12' to 1'10" below GS.

Hole plug 1'10' to 1' below GS.

Install road box.

Client: New England Telephone

Job Location: Burlington, VT

Engineer: Con-Test
Williston, VT

Inspector: Rob

Driller: Edward Westover

Helper: Hank Dawson

Materials: 10' screen, 2' riser,
1 cap, 1 locking plug, 3 sand,
1/3 hole plug, 1 road box.

SOIL PROBE LOG

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MW # 3

New England Telephone
Burlington, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

TYPE	HSA	SAMPLER	Continuous	SOIL
SIZE	2"		SS	Saturated
HAMMER	140#			Wet
FALL	30"			Moist
				Damp
				Slightly Damp

DATE STARTED: 12/09/93

DATE COMPLETED: 12/09/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

4-6' 4 7 12 17 19" Sat'd.

Brown fine sands over silty fine sands.

9-11' 30 13 17 21 14" Damp.

Compacted silty fine sands and gravel (till).

Auger to 13', set well.

2 hours - well development.

Screen 13' to 3' below GS.

Riser to surface.

Sandpack 13' to 2'6" below GS.

Hole plug 2'6" to 1'6" below GS.

Install road box.

Client: New England Telephone

Job Location: Burlington, VT

Engineer: Con-Test

Williston, VT

Inspector: Rob

Driller: Edward Westover

Helper: Hank Dawson

Materials: 10' screen, 3' riser,

1 cap, 1 locking plug, 3 sand,

1/2 hole plug, 1 road box.

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New England Telephone
Burlington, VT

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

DATE STARTED: 12/10/93

DATE COMPLETED: 12/10/93

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

E 12 18 24

```

..0-2'...1..5|..6|..7|..6|10"|Dry.
.....|.....|.....|.....|
..5-7'...1..5|..6|..6|..12|13"|Sat'd.
.....|.....|.....|.....|
.....|.....|.....|.....|
..10-12'...1..44|.....|.....|..4"|Dry.

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Brown top soil over medium/fine gravel.

Tan/brown medium/fine sands over silty clay with some fine sands.

Brown till and gravel.

Client: New England Telephone
Job Location: Burlington, VT
Engineer: Con-Test
Williston, VT
Inspector: Rob

Driller: Edward Westover
Helper: Hank Dawson
Materials: No fill.

SOIL PROBE LOG

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SB # 2

New England Telephone
Burlington, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA	SS	Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

DATE STARTED: 12/10/93

DATE COMPLETED: 12/10/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0-2'	4	6	7	12	5"	Dry.	Brown medium/fine sands and medium/small gravel.
2-5'	4	5	8	12	17"	Sat'd.	Brown fine to coarse sands (5") over red/brown clay with gravel throughout (small)
5-10'	21	28		12"		Moist/Dry.	Red/brown clayey silt 8" moist, over 4" gray till, dry.
10-15'	45	63		12"		Moist.	Gray till with small gravel and some red sand stone pebbles rounded.

Client: New England Telephone
Job Location: Burlington, VT
Engineer: Con-Test
Williston, VT
Inspector: Rob

Driller: Edward Westover
Helper: Hank Dawson
Materials: No well.

SOIL PROBE LOG

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SB # 3

New England Telephone
Burlington, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	HSA	SS	Wet
SIZE	2"		Moist
HAMMER	140#		Damp
FALL	30"		Slightly Damp

DATE STARTED: 12/10/93

DATE COMPLETED: 12/10/93

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0-2' 4 5 5 5 9" Dry.

Brown silt over medium/coarse brown sands and gravel (fill).

5-7' 1 1 1 1 5" Sat'd.

Brown medium/fine sands and small gravel.

13' 100/1 1 1 1 1/2" Sat'd.

Cement in tip. Could be pad for old tank.

Client: New England Telephone
Job Location: Burlington, VT
Engineer: Con-Test
Williston, VT
Inspector: Rob

Driller: Edward Westover
Helper: Hank Dawson
Materials: No well.

APPENDIX B

January 3, 1994

Page 1 of 2

Robert Giordano
Con-Test Environmental

Invoice #93-250-166

Date Sampled: 12/22/93

Date Received: 12/23/93

Date Extracted: 12/28/93

Date Analyzed: 12/30/93

Ref: New England Telephone
Main Street - Burlington, VT

Matrix: Water

The results of analyses requested are listed below:

<i>Lab#</i>	<i>Total Petroleum Hydrocarbons</i>
<i>Sample#</i>	<i>(mg/l)</i>
<i>Description</i>	
93B23953	ND
(MW-1)	
Monitoring Well #1	
93B23954	ND
(MW-2)	
Monitoring Well #2	
93B23955	ND
(MW-3)	
Monitoring Well #3	

Limit of Detection = 0.20 mg/l
ND = Not Detected

Analytical Method: EPA 418.1

Analyst: RMT

Page 2 of 2

 Robert Giordano
 Con-Test Environmental

 Invoice #93-250-166
 Date Sampled: 12/22/93
 Date Received: 12/23/93
 Date Analyzed: 12/27/93

 Ref: New England Telephone
 Main Street - Burlington, VT

Matrix: Water

The results of analyses requested are listed below:

MICROGRAMS/LITER

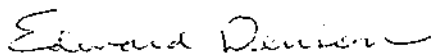
Lab#	93B23956	93B23957	
Sample#	(MW-1)	(MW-2)	LOD
Description	Monitoring Well #1	Monitoring Well #2	
Benzene	ND	ND	1.0
Toluene	1.0	ND	1.0
Ethylbenzene	ND	ND	1.0
Xylenes	ND	ND	3.0

Lab#	93B23958	
Sample#	(MW-3)	LOD
Description	Monitoring Well #3	
Benzene	ND	1.0
Toluene	ND	1.0
Ethylbenzene	ND	1.0
Xylenes	ND	3.0

 LOD = Limit of Detection
 ND = Not Detected

Analytical Method(s): EPA 8020

Analyst: MFF



Signature

 Tod Kopyscinski
 Director of Operations

 Edward Denson
 Laboratory Director

TOTAL PETROLEUM HYDROCARBONS QA/QC SUMMARY

 DATE: 12/30/93

 MATRIX: AIR: WATER: X SOIL: OTHER:

MBL	1.84
CONC. SPIKE	20 MG/L
SAMPLE RESULT	—
CONC. MS	20 MG/L
% RECOVERY	100%
CONC. MSD	20 MG/L
% RECOVERY	100%
RANGE	0%

LABORATORY ESTABLISHED CONTROL LIMITS		
WATER	% RECOVERY (71-101)	RANGE (0-17.2)
SOIL	% RECOVERY (59-109)	RANGE (0-23.0)

 COMMENT(S): RUN WITH 93B23953-23955

 ANALYST: RMT

 QC APPROVAL: *Robert C. Lynch*
 DATE: 12/30/93



con-test®

ANALYTICAL LABORATORY

39 Spruce Street • P.O. Box 591 • East Longmeadow, MA 01028 • FAX (413) 525-6405 • TEL (413) 525-2332 (800) 621-9081

VOLATILES SURROGATE RECOVERY SUMMARY

DATE: 12/27/93

MATRIX: WATER

LAB I.D.	601/8010 1-CHLORO-2 FLUOROBENZENE		602/8020 1-CHLORO-2 FLUOROBENZENE	
	PPB RANGE (10.5-19.7)*	PERCENT RANGE (70-131)	PPB RANGE (12.3-17.5)*	PERCENT RANGE (81-117)
METHOD BLANK	14.8	99	13.4	89
93B23956	13.3	89	13.7	91
93B23957	14.2	95	13.7	91
93B23958	14.6	97	13.9	93
LAB SPIKE	14.0	93	13.6	91

* = TRUE VALUE: 15 PPB

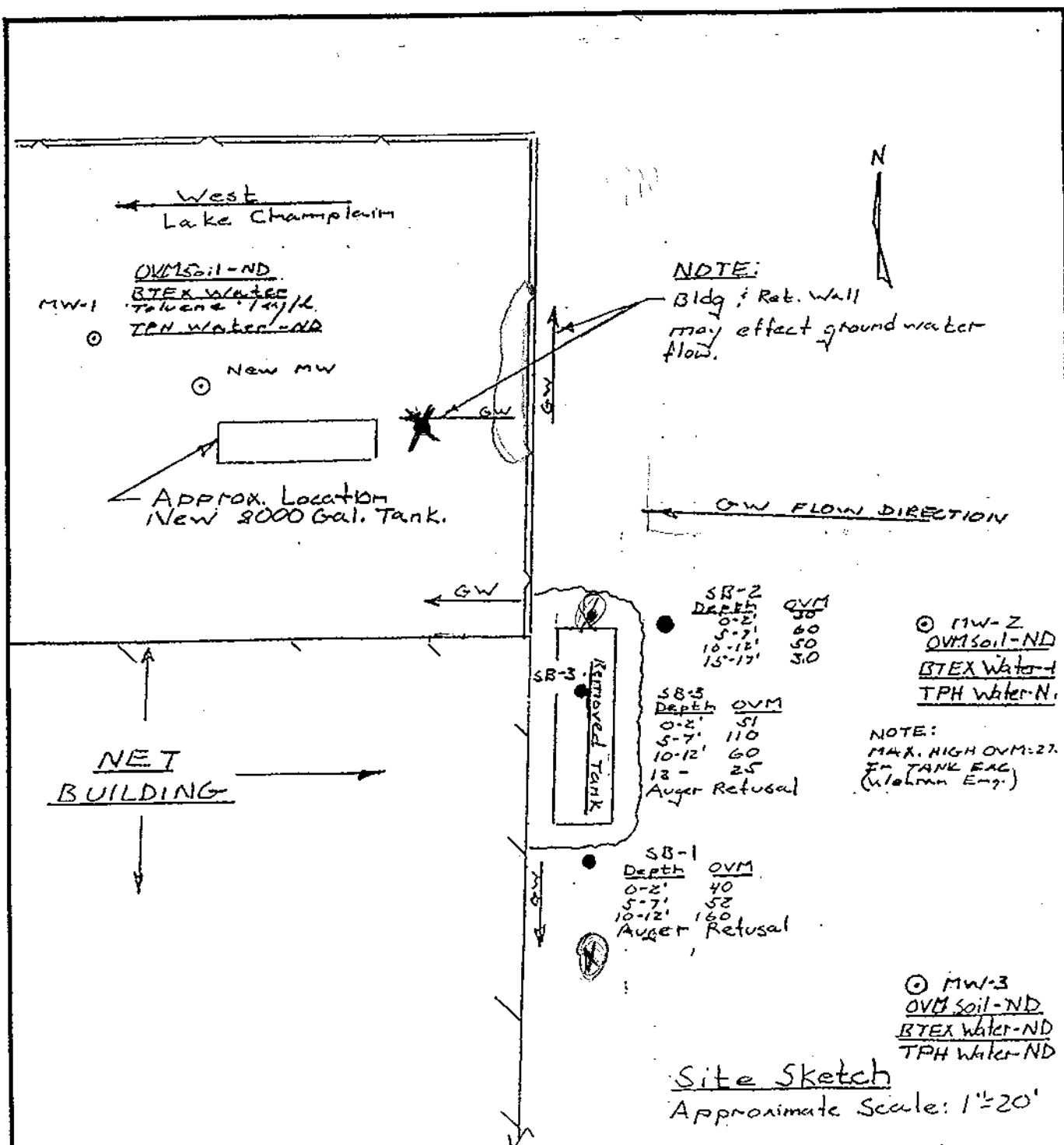
ANALYST: MFF


DATE: 12/27/93

QC APPROVAL: Tom E. Hays

DATE: 12/27/93

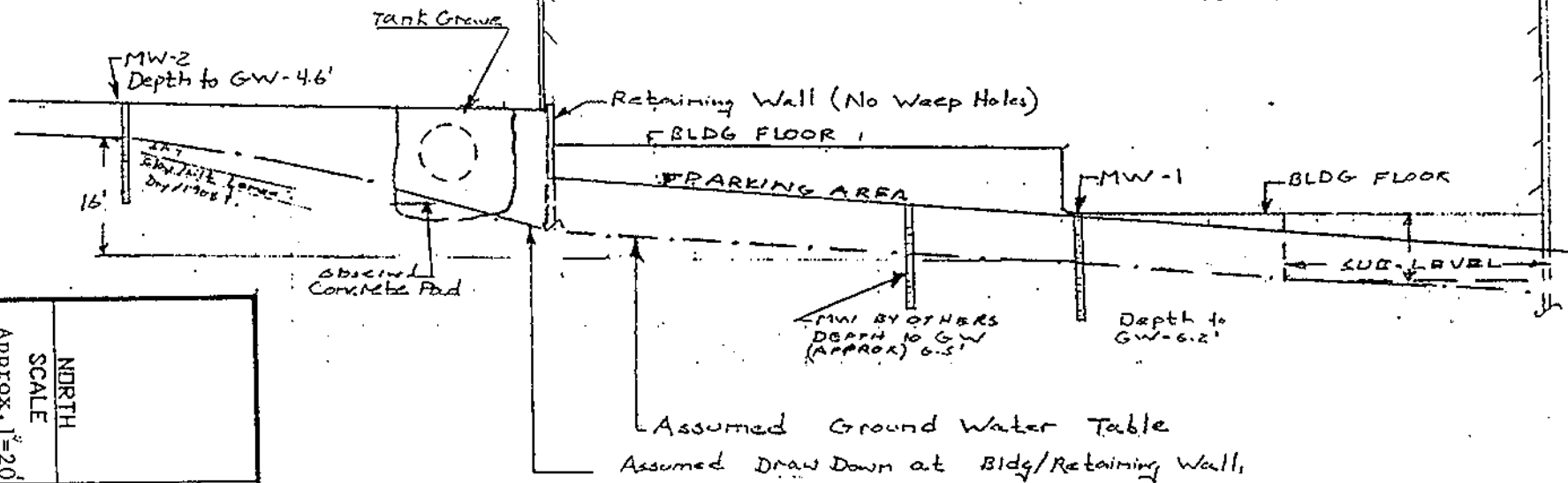
SKETCH A



 CON-TEST Inc. WATER AND AIR ENGINEERING			
SITE MAP NET - Burlington, Vermont			
NORTH SCALE	DRAWN BY: PEB	REVISION:	CHECKED BY:
	DATE:	PROJECT NUM. 94250-166	FIGURE Sketch A

SKETCH B

NET BUILDING BURLINGTON, VT



NORTH
SCALE
Approx. 1"=20'

DRAWN BY: EPB
DATE: PROJECT NO. 94250-166
CHECKED BY: sketch B

SITE CROSS SECTION
NET - Burlington, Vermont

CON-TEST Inc.
WATER AND AIR ENGINEERS